Radar-Directed Gun System Simulation (RADGUNS) 2.2 Released

Starting in September of 1999, SURVIAC began distributing the newest version of RADGUNS (Version 2.2) which was provided by the National Ground Intelligence Center (NGIC). RADGUNS is used to evaluate the effectiveness of Air Defense Artillery (ADA) gun systems against a penetrating aerial target. It can also evaluate the effectiveness of different airborne platform characteristics (RCS, maneuvers, use of electronic countermeasures, etc.) against a specific ADA system. RADGUNS is a complete one-on-one simulation including weapon system, operators, platform mode (RCS and presented/vulnerable areas), flight profiles, environment (clutter/multipath), electronic attack, and endgame. RADGUNS can assess many aspects of a weapon system's performance including platform detection, tracking performance, probability of hit and probability of kill, expected number of hits, and the effects of jamming.

This new version offers many important additions and improvements over its Version 2.1 predecessor. The following list outlines the key new features in RADGUNS Version 2.2:
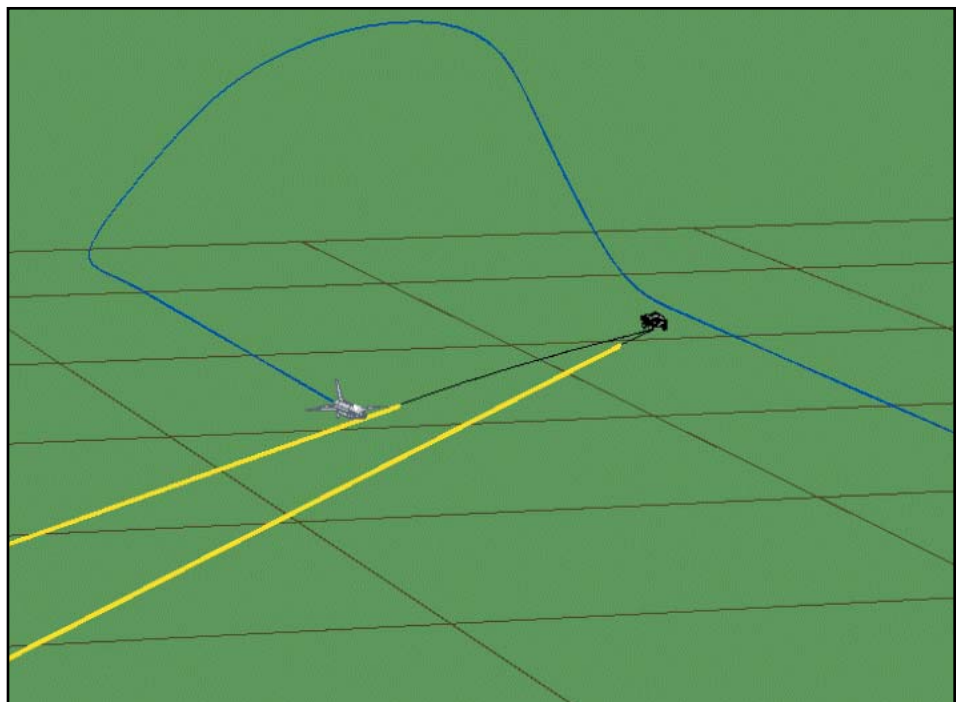
RADGUNS Results Viewed with IVIEW.

• The weapon system data for each gun system has been consolidated into external data files and as a result, the RADGUNS code is now unclassified (but not the weapons data files).

• New version contains updates resulting from the BLUEMAX-ESAMS-ALARM-RADGUNS-DIME (BEARD) alliance:

- Updated environment models as defined by ALARM have been integrated. These updated models are in Fortran 90. However, the previous Fortran 77 version environment models are also included for users lacking a Fortran 90 compiler.

- The BEARD-standardized RCS data file format has been expanded to allow additional data input including magnitude and

Report Documentation Page

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1. REPORT DATE **2000**	2. REPORT TYPE	3. DATES COVERED **00-00-2000 to 00-00-2000**

4. TITLE AND SUBTITLE **SURVIAC Bulletin: Radar-Directed Gun System Simulation (RADGUNS) 2.2 Released, Volume 15 Issue 4**	5a. CONTRACT NUMBER
	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **JAS Program Office,200 12th Street South,Crystal Gateway #4, Suite 1103,Arlington,VA,22202**	8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**16**	

In This Issue:

SURVIAC Bulletin Vol XV   Issue 4

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SURVIAC Liaison Workshop Held

Liaison Workshop attendees (L to R) Kevin Crosthwaite-SURVIAC Director, MSGT Anthony Harris - 653 CLSS/LGXY, Donna Egner - SURVIAC Deputy Director, Elizabeth Kee - ANSER Corp., Tony Montero - General Electric Engines

In June 1996 SURVIAC implemented an innovative liaison program to expand the SURVIAC user base through the on-site training for Government and Industry volunteers located remotely from the Wright Patterson AFB, Ohio office. The purpose of the Liaison training program is two-fold. The objective is to increase the knowledge about SURVIAC and what resources we have to support other agency's/company's mission. The second objective is to inform us about user's respective needs so that we can better support them in the future. Since then a total of four successful Liaison Workshops have been held at the SURVIAC facility. The most recent workshop was opened to industry personnel and took place 26 October- 29 October 1999. Attendees were Mr. Tony Montero from General Electric Engines, Ms. Elizabeth Kee of ANSER Corporation, and MSGT Anthony Harris of the 653 CLSS/LGXY Robins AFB, GA.

Noon Tuesday through noon Friday was spent investigating databases and libraries, performing searches, reviewing products and models, reviewing Technical Area Tasks, becoming familiar with key survivability and lethality agencies, as well as simply becoming familiar with the day-to-day operation of the SURVIAC office. Discussions were held relative to several ongoing efforts in the survivability/lethality communities. A briefing was presented by the DTIC IAC Program Office informing each participant on how the IACs and DTIC interrelate and how they are available to support the varied warfighter missions. The last day was spent discussing the needs of each liaison and how a more effective relationship through this program might be established. In addition to the instruction, participants received products and models of their choice.

Overall comments from the workshop were positive and attendees came away with the realization that a vast amount of information is available both at SURVIAC and throughout the community. SURVIAC now currently has a liaison relationship with OPTEC, ARL, USARDC, NAWC, NSWC, ASC/OL, and ANSER Corp.

The next Liaison Workshop is planned for 22-24 August 2000.

If you would be interested in becoming your organization's SURVIAC liaison, please call Ms. Donna Egner at Com: (937) 255-4840, DSN 785-4840, or E-mail at degner@bah.com.

SURVIAC At Your Service

One of the principal reasons for establishing Information Analysis Centers (IACs) is to provide Department of Defense (DoD) components access to a group of Joint Service oriented centers staffed with technology experts. The IACs furnish unbiased analytical and evaluative technology services, as well as a corporate memory of prior DoD work and subject knowledge, to Defense Research and Development (R&D) work-related programs. SURVIAC provides the DoD community with a one-stop resource for all aspects of nonnuclear survivability, lethality, and mission effectiveness. Our goal is to increase the knowledge and productivity of scientists, engineers, analysts, and program managers engaged in weapons system research, development, acquisition, and support. We can be of particular assistance in addressing the challenges of enhancing system survivability and lethality.

"SURVIAC provides the DoD community with a one-stop resource for all aspects of nonnuclear survivability, lethality, and mission effectiveness."

Resources and Services

SURVIAC provides information resources and analytical services to support the development and fielding of more survivable and effective combat systems. We maintain libraries, computer models, methodologies, and databases and disseminate information and models to US Government organizations and their contractors. Most importantly, we offer expertise with the available information resources across the survivability and lethality technical area. Our analysts provide analytic services in response to user requests and carry out special studies and tasks. For more in-depth support, SURVIAC also maintains a network of outside experts in Government, industry, and academia to answer technical questions and support special studies.

As you know, SURVIAC's field of interest is nonnuclear survivability as it relates to U.S. and foreign aeronautical and surface targets. As such, SURVIAC encompasses survivability design, survivability technology, survivability assessment, and munitions effectiveness/weapon lethality areas, including applicable models and methodologies. The aeronautical targets within SURVIAC's field of interest include fixed- and rotary-winged aircraft, missiles, and remotely piloted vehicles; surface targets include tanks, trucks, armored personnel carriers, artillery, radar vans, shelters, boats, ships, carriers and other similar items. The nonnuclear threats within SURVIAC's field of interest include (1) conventional weapons (i.e., small arms/automatic weapons (SA/AW), anti-aircraft artillery (AAA), surface-to-air missiles (SAM), air-to-air guns, air-to-air missiles (AAM), field artillery and direct-fire weapons (i.e., tanks, TOW, etc.), (2) directed energy weapons including lasers, millimeter wave, microwave and particle beams, and (3) chemical/biological weapons. As a survivability/lethality professional, when you need additional leverage in your work as you design, test, or operate weapons systems, we can help. The SURVIAC Subscription Plan, TAT, or bibliographic/technical inquiry is one means to tap into SURVIAC assistance.

The analytical and technical tasks capability is a component of each DTIC sponsored DoD IAC contract. The procedures necessary to initiate Subscriptions, Technical Area Tasks (TAT) or bibliographic/technical inquiries is relatively simple and requires modest documentation.

SURVIAC Subscription Plan

A SURVIAC Subscription Plan can benefit any government or industry organization involved in weapons systems survivability or lethality research, development, testing, or acquisition by easing access to the full range of SURVIAC resources. SURVIAC's Subscription Plan, tailored to your special needs, provides extra value to repeat users. SURVIAC currently assesses fees for models and documentation, products, and technical inquiries depending on the level of effort required. Purchasing a Subscription Plan

allows you to establish a deposit account to be used for those products and services. Several example uses of SURVIAC Subscription Plans are described below:

a. An office has a need to stay up-to-the-minute on a particular technology or topic area. The Subscription Plan could provide for SURVIAC to conduct extensive literature searches on a quarterly or bimonthly basis to gather all the late breaking information.

b. An Agency may not have sufficient manpower to cover all the pertinent meetings/conferences/symposia in its area of interest. Their Subscription Plan could entail a technical person from SURVIAC to travel and attend some of these meetings and to draft minutes on presentations of interest to that agency.

c. A company might be a frequent purchaser of SURVIAC products and attend several SURVIAC Workshops. Their Subscription Plan could be debited for each purchase rather than repeatedly preparing independent Purchase Orders. This could cover products, model fees, workshop attendance, model training, etc.

d. An Agency needs assistance installing new models and initially training personnel on those models. A Subscription Plan could cover that expense. In addition, an account could cover continued consulting and additional training as required.

e. Some combination of all the above.

There is a great deal of flexibility inherent in the Subscription Plan. The primary advantage of having a Subscription Plan already in place is to increase SURVIAC responsiveness to your needs. Once your account is established, only a phone call is required to initiate whatever support you require.

Government Subscription Plans permit Government activities to establish deposit accounts with the SURVIAC which may be drawn upon to obtain basic services. Examples might include SURVIAC publica-

tions and products in paper, electronic, or other media; technical inquiry assistance, individual or small group training; and attendance at SURVIAC sponsored/hosted/administered conferences, meetings, symposia, or workshops.

Industry Subscription Plans allow non-government activities to establish deposit accounts with the SURVIAC. With proper authorization, these accounts may be drawn upon to obtain basic services to include SURVIAC publications in paper, electronic, or other media, SURVIAC technical inquiry assistance, attendance at SURVIAC sponsored/hosted/administered conferences, meetings, symposia, or workshops, and individual or small group training.

SUMMARY

One of the functions of SURVIAC, as a full-service DoD IAC, is to pursue and conduct Technical Area Tasks for the DoD and other government agencies. The only stipulations on these tasks are that they must be beyond the scope of the Center's basic core operation, relevant to SURVIAC's primary field of interest, and funded by the requesting/sponsoring activity.

These activities contribute greatly to the ability of SURVIAC to provide expert, authoritative services and unbiased advice to the Government on the validity, meaning and evaluation of survivability and lethality.

IAC Awareness Conference

The Defense Technical Information Center Information Analysis Center Program Management Office will sponsor an IAC Awareness Conference on May 16, 2000 at the Hope Hotel, Wright Patterson Air Force Base, Ohio. The theme of this conference is "Key Challenges" that need to be conquered to enable us to meet Vision 2010. The meeting is open to all Department of Defense (DoD) and associated industry personnel..

Electronic registration is encouraged via the SURVIAC website at http://iac.dtic.mil/surviac. Additional registration information may be obtained from Ms. Donna Egner, SURVIAC, com: (937) 255-4840, fax: (937) 255-9673, or e-mail: degner@bah.com

BRL-CAD 5.0
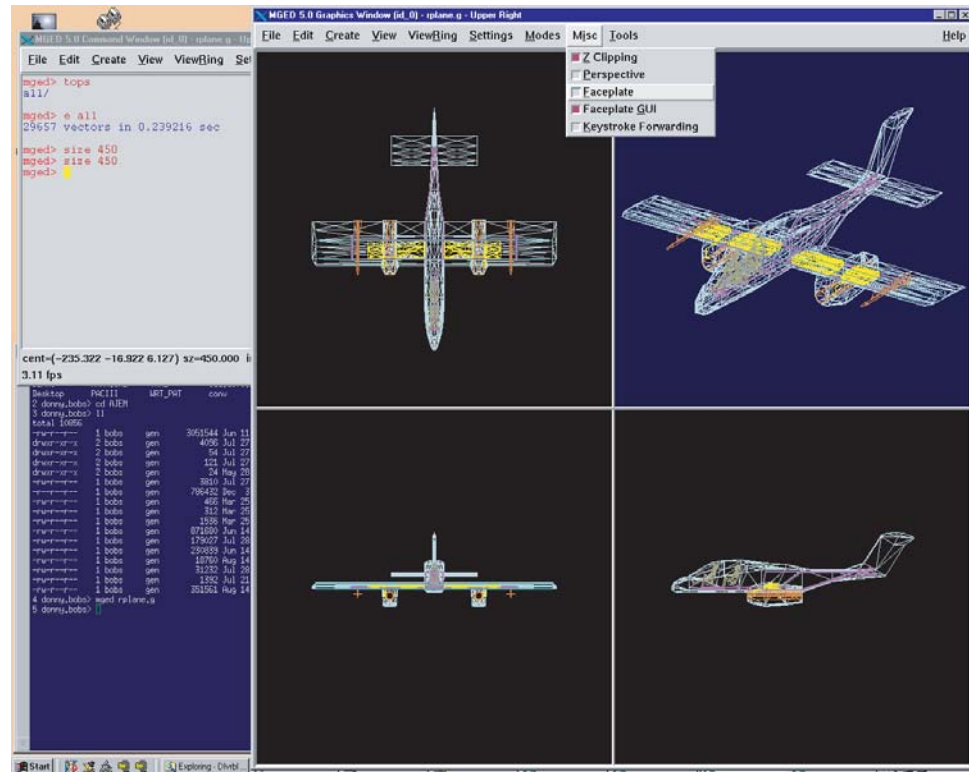
Multi-view Windowing

The newest release of BRL-CAD, version 5.0, is now available. The BRL-CAD package is a powerful constructive solid geometry (CSG) modeling system. The CSG approach to geometric modeling applies Boolean operations on various 3-D volumes to produce a resulting volume or region of a desired shape. The 3-D volumes have traditionally consisted of a set of basic geometric solids or primitives, however, it has been expanded to include volumes enclosed by various types of surfaces such as polygons and B-splines.

The real power and value of BRL-CAD, however, is the various software libraries which support a wide base of analyses and simulations using these geometric models. The ray-tracing library (librt) provides the primary means of geometric model interrogation. Using the ray-tracing routines, geometric information about the model can be obtained by mathematically intersecting lines with objects in the model. Application programmers need to know nothing about the details of the geometry or ray-tracing, only how to invoke the sup-

plied routines. This process is directly applicable to a wide range of applications, from classic vulnerability/lethality to optical rendering to various signature simulations.

A large number of utilities are also provided for manipulating images and frame buffers. Commonly used image formats supported in BRL-CAD include run length encoded (rle) files, Sun bitmap files, and BRL-CAD's own raw data format (pix) files. Other utilities used to enhance and modify images include image rotation, comparison, extraction, scale, inversion and statistics.

The frame buffer library (libfb) provides a device independent distributed interface to a raster display, used for displaying images. Using this library, one can access many different display types, including those on other machines on the network. The details of the network connection are transparent to the user, providing a convenient way of displaying images that were generated on a machine without display capabilities. A

library of routines also exists to create BRL-CAD databases from software without using the interactive Multiple display Graphics Editor, MGED. This library is used to develop modeling application tools. Important conversion programs in vulnerability analysis are PATCH-G and FAST4-G, which permit converting FASTGEN 3 and 4 developed models into the BRL-CAD binary format.

The newest release of BRL-CAD, version 5.0, became available on 27 September 1999. Among the new features of version 5.0 are:

- entirely new graphical user interface for MGED based on Tcl/Tk
- Tcl/Tk interface to many of the other capabilities of BRL-CAD
- much improved NMG performance
- improved converters to/from other geometry formats
- support for the PNG image format
- additional shaders for RT
- new utilities and programming libraries

Significant effort has been applied to improving the n-Manifold Geometry (NMG) primitive rendering capability, extending cross-platform hardware operation, and adding the Tool Command Language and toolkit (Tcl/Tk). For the common BRL-CAD modeler, the addition of Tcl/Tk and the subsequent revision of the traditional Multiple-display Graphics Editor (MGED) interface are the most obvious improvements. The traditional MGED interface, new XMGED interface, and experimental Tcl/Tk interface of versions 4.4 and 4.5

have been merged into a single MGED interface. Version 5.0 by default retains the traditional MGED two-window interface (text console and graphics display). However, the interface is a Tcl/Tk based windowing program rather than hardware dependent graphic routines. Consequently, the default configuration may be individually reconfigured to suit each user's preferences by creating and using Tcl/Tk scripts in an MGED resource file.

Additionally, both the text console and graphics display contain a duplicate series of pull down menus allowing full access from either active window. The pull-down menus provide the familiar tools of long time BRL-CAD users, while adding new interactive utility to MGED's interface. Enhancements such as multi-view windowing, relative or absolute increment mode, alternate mouse mode, and on-line help menus are also available as part of the new MGED interface.

Completely new to the 5.0 MGED interface is the ability to interactively select individual components displayed or rectangular portions of the graphics display for rendering as part of the graphics window. The
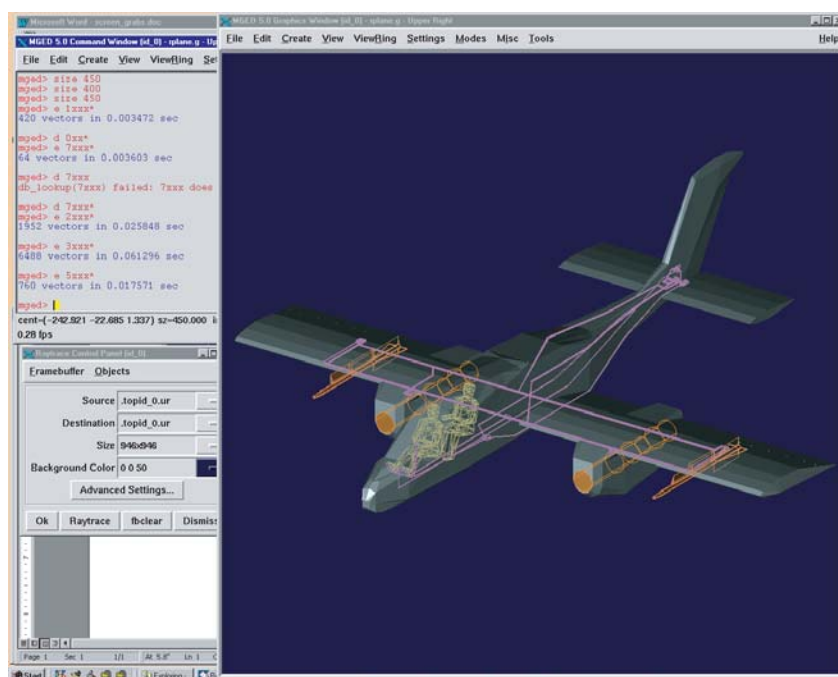
Rendered image within the Editor Graphics Window.

Model Spotlight

phase data, multiple frequencies, fluctuation data that is dependent on target aspect, and variable azimuth and elevation increments.

- Supports the new .EAR BLUEMAX IV flight path file format.

• A new second order FCC has been developed, and is now used for those weapon systems assessed as having s second order FCC.

• Compiling RADGUNS now results in a single executable rather than one for each gun system.

• Two new weapons systems were added:

   - Goalkeeper Close-In Naval Weapon System consisting of the 30-mm GAU-8 gun with a derivative of the Flycatcher radar.

   - Oerlikon-GDF 003 35-mm guns and the Skyshield radar.

• Six-view data is converted to 26 views for all P-hit and P-kill calculations.

• RADGUNS includes an updated and improved full manual set including electronic Adobe Acrobat (PDF) versions on the CD-ROM.

This new version is available directly from SURVIAC on CD-ROM which includes both the PC and UNIX versions, as well as the full manual set in Adobe Acrobat (PDF) format.

Order requests can be directed to Mrs. Geri Bowling, SURVIAC, Com: (937) 255-4840 or E-mail: gbowling@bah.com. Technical questions should be directed to Michael Bennett at Com: (937) 431-2707or E-mail: bennett_michael@bah.com.

interactive selection process may also be used to generate line-of-sight (LOS) queries for individual rays originating at the cursor and propagating into the display. The LOS data may be used for debugging geometry or making shotline predictions for Live-Fire tests. Alternative output content and format is user selectable (refer to the NIRT documentation). Additional new capabilities include interactive color selection, new material shaders, opening alternate files within the current MGED session, and user defined Tcl/Tk scripting macros.

The newest extension in hardware support is the port to PC hardware operating with the Linux or FreeBSD systems. The graphical display can be attached in either X or Open GL graphics. Performance is comparable to operating on SGI and SUN platforms of similar processor speed and memory. The beta release of BRL-CAD was operated remotely using an X emulation interface on desktop PCs running Windows NT, while the BRL-CAD application ran on SGI hosts. Degradation in remote operation occurred when four or more remote sessions were running simultaneously, including raytracing operations. This remote operation capability extends into the final release of version 5.0. These capabilities greatly extend the users' hardware and software resource options in accessing and operating BRL-CAD.

BRL-CAD 5.0 is available from SURVIAC with full-service support. This includes installation support, maintenance release updates, technical support and information on future activities. For users who prefer not to compile and install from source code, precompiled executables for Linux, FreeBSD, and IRIX can be requested during registration.

For details, contact "BRL-CAD full-service distribution" at 410-273-7794 or send e-mail to cad-dist@arl.mil.

Model Spotlight
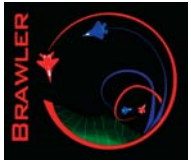
BRAWLER 6.4 Released

SURVIAC is pleased to announce that BRAWLER Version 6.4 is available for distribution. BRAWLER simulates air-to-air combat between multiple flights of aircraft in both the visual and beyond-visual-range (BVR) arenas. BRAWLER's current configuration is capable of handling a total of 20 aircraft in as many as 10 independent flights with up to 8 aircraft per flight simulation. This simulation of flight-versus-flight air combat is considered to render realistic behaviors by Air Force pilots. BRAWLER incorporates value-driven and information-oriented principles in its structure to provide a Monte Carlo, event-driven simulation of air combat between multiple flights of aircraft with real-world stochastic features.

BRAWLER 6.4 enhancements include the integration of the latest MARS/BRAWLER interface (Mission Avionics Requirement System) and the next generation of the EADSIM/BRAWLER Confederation (Extended Air Defense Simulation). While operating in the confederation mode, BRAWLER now has the capability to implement dynamic ghosting, the ability to receive vectoring commands from EADSIM controllers, enhanced transfer of control mechanisms, and model EADSIM digital terrain. Version 6.4 also utilizes an improved Anti-Radiation Missile (ARM) seeker model by transitioning from a noise-based seeker to a signal-based seeker model. Two new launch modes are also introduced for use on missiles with an ARM seeker. In addition, an implemented concept of primary and secondary modes has been added for the same flare, when user specified conditions are satisfied for the secondary mode. Moreover, the pilot can select a missile configuration which includes: launch modes, launch acceptability regions (LARs) and a guidance law. Updates to the mctrl7 guidance algorithm can now provide the user a generically applicable guidance law that could be easily

applied to notional missiles. Users may now assign missiles to specific pylons and also model missile seeker obscuration on the rail. BRAWLER 6.4 allows the user to specify radar measurement errors and allows radar to have perfect resolution. The user now has the added capability to model the effects of precipitation and/or atmospheric particles on the transmission of Radio Frequency (RF) energy. An explicit model of Joint Tactical Information Distribution System (JTIDS) will now allow participants to maintain their own track-banks. Furthermore, tracks instead of observations will be exchanged on a Data Link Device (DLD). A higher fidelity Missile Launch Warning Device (MLW) using General Dynamics/Martin Marietta Infra-Red (GD/MM IR) model can now be selected, but the current MLW device has been retained as the basic model. The capacity to expend countermeasures has also been added to the MLW. A Non-Cooperative Identification (NCID) option was added to correct shortcomings in the Identification, Friend or Foe (IFF) model. Finally, the Kalman filter enhancement should improve angle-only tracking.

The BRAWLER model manager is Major Robert Siegle, AFSAA/SAAA. Major Siegle can be reached at DSN 425-8680, commercial phone (703) 588-8680, or e-mail address robert.siegle@pentagon.af.mil. The BRAWLER software provided by SURVIAC is classified and includes generic data sets. Classified data sets for BRAWLER 6.4 can be obtained from the following government points of contact: Blue data sets are available from Maj Siegle with prior release authority from the data owner. (For example, to obtain an F-16 data set for BRAWLER, permission is required from the F-16 SPO). For Red and Grey data sets contact Mr. Jim Williams, NAIC/TAAE, DSN 787-2404, commercial phone (937) 257-2404 or e-mail address Jtw226@naic.wpafb.af.mil.

Model Spotlight

SURVIAC Product Availability

SURVIAC is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Technical Information Center (DTIC)

Products

Product	Classification	Reproduction & Handling Fee
A Critical Review of Graphite Epoxy Laser Damage Studies	SECRET	$ 50.00
A Summary of Aerospace Vehicle Computerized Geometric Descriptions for Vulnerability Analyses	Unclassified	$100.00 (Free to Gov't)
Advanced Materials for Enhanced Survivability	SECRET	$100.00
Aircraft Engine Analysts Reference Manuals (ARM) - 9 Volumes	SECRET	$400.00/Per Set
Aircraft Fuel System Fire and Explosion Suppression Design Guide	Unclassified	$150.00/3 Volumes
'Aircraft Survivability' Video	Unclassified	$ 50.00 or 30-Day Loan
Alternatives For Halon 1301 In Army Ground Vehicle Firefighting Systems	Unclassified	$250.00
An Overview of Laser-Induced Eye Effects	SECRET	$150.00
An Overview of Laser Technology and Applications	Unclassified	$ 50.00
Army Survivability Information Resource Database	Unclassified	$200.00
'Battle Damage Repair of Composite Structures' Video	Unclassified	$ 75.00
Collection of Vulnerability Test Results for Typical Aircraft Systems and Components	CONFIDENTIAL	$150.00
Comparative Close Air Support Vulnerability Assessment Study - Executive Summary	SECRET	None (Gov't. Only)
Compendium of References for Nonnuclear Aircraft Survivability (A Supplement to MIL-HDBK-336)	Unclassified	$150.00
Component Vulnerability (Pd/h) Workshop Component Pd/h Handbook w/addendum	SECRET	$200.00 (Free to Gov't)
Countermeasures Handbook for Aircraft Survivability (3 Volumes)	SECRET	$200.00 (Free to Gov't)
Critical Review and Technology Assessment (CRTA) for Soldier Survivability (SSv)	Unclassified	$ 50.00
'Designing for Survivability' Video	Unclassified	30-Day Loan
DOD Directive 5000.1 and DOD Instruction 5000.2/5000.2M Survivability Excerpts	Unclassified	$ 50.00 (Free to Gov't)
Fuel Tank Ullage Explosion Hazard State-of-the-Art Report (SOAR)	Unclassified	$ 50.00
Gas Explosion Suppression Agent Investigation	Unclassified	$200.00
Joint Live Fire/Live Fire Test Program Catalogue, Version 3.1	Unclassified	$ 95.00
Joint Live Fire Test Program Aircraft Systems FY86, 87, 88 and FY88-90 Videos	Unclassified	$ 50.00/Each
National MANPADS Workshop: A Vulnerability Perspective Proceedings 2 Volumes	SECRET	$200.00
Penetration Characteristics of Advanced Engine Materials	Unclassified	$100.00
Proceedings of the Eighth DOD Conference on DEW Vulnerability, Survivability and Effects - 2 Volumes	SECRET	$125.00/Per Set
RADGUNS 1.8 Parametric Study	SECRET	$100.00 (Free to Gov't)
Ship Survivability Overview	Unclassified	$ 50.00
'SURVIAC - A Capabilities Overview' Video	Unclassified	30-Day Loan
Survivability Systems Master Plan	Unclassified	$ 50.00 (Free to Gov't)
Testing of Aircraft or Aircraft Surrogates with On-Board Munitions	Unclassified	$100.00
"Threat Effects in Aircraft Combat Survivability" Video	Unclassified	$150.00 or 60-Day Loan
Unmanned Aerial Vehicles Survivability Compendium—Interim Report Database	Unclassified	$200.00
U.S. Air Force Surface-To-Air Engagements During Operation Desert Storm	SECRET	$100.00 (Free to Gov't)
Vulnerability Reduction Design Guide for Ground Systems in a Conventional Combat Environment	Unclassified	$200.00

SURVIAC
Survivability/Vulnerability Information Analysis Center

SURVIAC Model Availability

SURVIAC is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Technical Information Center (DTIC)

Model	Classification	Reproduction & Handling Fee	
		Model	Documentation
MIL-AASPEM — Man-in-the-Loop Air-To-Air System Performance Evaluation Model	Unclassified	$500.00	$ 80.00[+]
AIRADE 7.4—Airborne Radar Detection Model	Unclassified	$500.00	$ 36.00
ALARM 4.1—Advanced Low Altitude Radar Model	Unclassified	$500.00	$ 60.50[+]
BLUEMAX IV—Variable Airspeed Flight Path Generator	Unclassified	$500.00	$ 15.00[+]
BRAWLER 6.3—Air-To-Air Combat Simulation	SECRET	$500.00	$231.50[+]
BRL-CAD—Ballistic Research Laboratory Computer-Aided Design Package*	Unclassified	$500.00	N/A
COVART 4.1—Computation of Vulnerable Area and Repair Time	Unclassified	$500.00	$ 37.00
DIME—Digital Integrated Modeling Environment	Unclassified	$500.00	$ 63.00
ESAMS 2.8.2—Enhanced Surface-To-Air Missile Simulation	SECRET	$500.00	$295.50[+]
FASTGEN 3.2—Fast Shotline Generator	Unclassified	$500.00	$ 52.00
IVIEW 2000—Graphical User Interface for Output Simulation	Unclassified	$100.00	[+]
JSEM - Joint Service Endgame Model	Unclassified	$500.00	TBA*
LELAWS 3.0—Low Energy Laser Weapons Simulation	Unclassified	$500.00	$ 31.50
RADGUNS 2.2—Radar-Directed Gun System Simulation	SECRET	$500.00	$ 69.50[+]
TRAP 3.1a—Trajectory Analysis Program	Unclassified	$500.00	$256.00
TRACES—Terrain/Rotorcraft Air Combat Evaluation Simulation	Unclassified	$500.00	$127.00

Models

* For more information regarding BRL-CAD or JSEM documentation, contact Mr. Bob Strausser at the SURVIAC Aberdeen Satellite Office, (410) 273-7722.

+ Documentation included with code on CD version of Model at no charge

For further information on how to obtain these models and how to establish need-to-know certification, please contact SURVIAC at (937) 255-4840 or DSN 785-4840. Requests from non-U.S. agencies must be   forwarded to their country's Embassy in Washington DC, Attn: Air Attache's Office.

Upcoming Model Meetings

The following is a list of upcoming model meetings. For more information on these meetings, please contact Mr. Paul Jeng, Booz•Allen & Hamilton Inc., Com: (937) 431-2712 or by E-mail: surviacmodels@bah.com. Also, visit our web site at: *http://iac.dtic.mil/surviac.*

JMASS Users & Analysts Group Meeting
24-27 April 2000
Dayton, Ohio

JTCG/AS Model User Meeting (JMUM) (formerly D'DEAF_CRAB)
14-16 June 2000
USAF Academy, Colorado Springs, Colorado

BLUEMAX, ALARM, RADGUNS Meeting
14-17 November 2000
NGIC, Charlottesville, Virginia

BRAWLER and ESAMS concurrent meetings
28-30 November 2000
Nellis AFB, Nevada

Call for Presenters

The Joint Technical Coordinating Group for Aircraft Survivability (JTCG/AS) Model Users Meeting (JMUM) combines both integrated and separate model meetings. The meeting contains general model briefs and modeling related briefings. If you are interested in making a presentation, please call Linda Hamilton , Com: (937) 431-2746, E-mail: hamilton_linda@bah.com

JMASS Customer Conference

The JMASS Joint Program Office (JPO) is hosting a users conference in Dayton, Ohio, 24-27 April 2000. The objectives of the conference are to:

• Educate the modeling and simulation (M&S) community on JMASS capabilities,
• Establish and promote joint, community-wide User-Developer interaction, and
• Facilitate industry involvement in supporting JMASS development.

This conference provides the first opportunity for all current and potential JMASS users to develop a clear and common understanding of the capabilities and directions of JMASS. It brings together previous efforts of the JMASS Users Group (JUG) and the JMASS Analyst Working Group (JAWG).

The conference will include presentations and Q&A panels with the Services' senior leaders. This forum will also include combined user-developer working groups to generate knowledgeable feedback to the JPO. This is a golden opportunity to influence the future of JMASS as it matures to fill its key role in the M&S arena. For more information on the conference, go to http://jmass.iitri.org. Visit the JMASS web site at: http://www.jmass.wpafb.af.mil

Model News

NDIA Combat Survivability Annual Awards Presentation

The National Defense Industrial Association (NDIA), Combat Survivability Division, held their annual symposium 16-18 November 1999 at the Naval Postgraduate School, Monterey, California. The subject of the symposium was "Aircraft Survivability 1999 Challenges for the New Millennium." The symposium chairman was Mr. David Hall, Naval Air Warfare Center Weapons Division (NAWCWPNS.) Vice Admiral John Lockard, US Navy Chairman, Joint Aeronautical Commanders Group and Commander Naval Air Systems Command provided the keynote address on "Aircraft Survivability in the New Millennium." An excellent war fighter's review of Operation Allied Force in Kosovo was provided by Col. Jeffrey Eberhart, US Air Force Commander 31st Operations Group, Aviano, Italy

The rest of the symposium was organized into several different sessions on key threats - EO/IR missiles, RF SAMS, non-traditional DEW threats, and wrapped up with excellent presentations on how current programs are integrating survivability efforts into their design to defeat these threats. The symposium was well attended.

Mr. Ralph Lauzze

One of the highlights of the program was the presentation of several awards. Mr. Ralph Lauzze was presented with the NDIA Leadership Award for combat survivability This award recognized his major contributions as the JTCG/AS Chairman, Director of the JLF program and his leadership with the Air Force 46th Test Wing.

Dr. David Bonnesar

Dr. David Bonnesar, President, BONN Corporation, received the NDIA Technical Award for combat survivability for his superior achievement in low observable aircraft mission planning tool development. His technical work in this field contributed significantly to the exceptional combat survivability record of the SR-71, U-2, and the F-117 stealth fighter.

Mr. Dale Atkinson received a special NDIA Lifetime Achievement Award. This award recognized Dale's instrumental work in setting up the Air Force Survivability and Safety Branch, setting up and guiding the JTCG/AS, instigating SURVIAC, and numerous other key contributions to the survivability discipline.

Mr. Dale Atkinson

Recognition for the best poster paper was also presented to Alex Kurtz, Leo Budd, and Mark Mahaffee. Please join us in congratulating each of these deserving winners.

Gun and Missile Pedigree Threat Reports

Gun and Missile Pedigree Threat Reports have recently been completed by ASC/ENMM and are available for distribution on CD-ROM through SURVIAC. The CD-ROM contains Volume 1, "GUNS - Endgame and Vulnerability Threat Data": Version 4.01, November 1999 and Volume 2, "MISSILES - Endgame and Vulnerability Threat Data": Version 5.01, November 1999. The CD-ROM is classified. Volumes 1 and 2 are available at a cost of $150.00.

The purpose of the two threat reports is to document the vulnerability analysis data requirements, data gathering process and the threat data needed for gun and missile vulnerability analyses. The bulk of each report is related to threat data. These two reports convert raw threat data into data ready for use with COVART, or SHAZAM for vulnerability or endgame analyses. In the past, raw data from test reports and/or threat reports lacked this data. In order to ensure complete and quality information is provided, ASC/ENMM converted the raw data into the final format for COVART and SHAZAM. When test reports were incomplete, data estimates were generated using a consistent approach and assumptions were documented.

The "GUNS" Pedigree Threat Report contains projectile characterization data (COVART Threat Data Files) for small arms upt to antiair API and HEI projectiles. Both the API and HEI data were obtained from threat reports or other quality references. Furthermore, the HEI data used in COVART 4 was verified and validated based upon a methodology developed to support the B-1B LFT&E Program. The COVART 4 resultant fragment patterns (number of impacts (non-holes) and holes as a function of radius from the shotline on a flat plate) was compared to dynamic test patterns. This analysis clearly demonstrated which data was

best. The best characterization data is included in this report.

The "MISSILES" Pedigree Threat Report contains missile warhead characterization data (COVART AND SHAZAM Threat Data Files) on air-intercept missiles and surface-to-air missiles. This report also contains a general description of COVART, SHAZAM, warhead characterization data, missile threat database development process, missile fragment threat database development process, blast methodology and missile debris characterization process.

These reports are a product of many years of ASC/ENMM data gathering. The reports were generated so ASC/ENMM studies and contractor studies would use consistent/standardized threat data throughout a number of Air Force Programs (i.e., B-1, F-22, JSF, etc.). Earlier versions of these two reports are currently being used by a number of organizations including B-1, B-2, F-22, F-117, and JSF as well as being used to support a number of Analysis of Alternatives (AoA) studies. These two reports can now be used for all existing and future studies to improve quality, standardize results and reduce cost.

Data provided in these two documents are provided as is. The user of these documents should use this information as a guide, not the last word on projectile, or warhead characterization data.

For information on the GUN and MISSILE Pedigree Threat Reports contact Mr. Hugh Griffis, ASC/ENMM, Com: (937) 255-4358, DSN: 785-4358, or e-mail: hugh.griffis@wpafb.af.mil.

For information on how to obtain these products and to establish need-to-know certification, contact SURVIAC at (937) 255-4840, DSN 785-4840.

APRIL

JMASS Users & Analysts Group Meeting
April 24-27, 2000
Dayton, Ohio
POC: SURVIAC, Mr. Paul Jeng
Com: (937) 431-2712, E-mail: surviacmodels@bah.com

MAY

National LFT&E Conference
May 8-12, 2000
University of Texas, Austin, Texas
POC: National Defense Industrial Association (NDIA), Event #012
Com: (703) 522-1820, FAX: (703) 522-1885, E-mail: ddewitt@ndia.com
Online Registration: www.ndia.org

IAC Awareness Conference, *"Key Challenges"*
May 16-18, 2000
Wright-Patterson AFB, Ohio
POC: Ms. Donna Egner, SURVIAC, Com: (937) 255-4840, Fax: (937) 255-9673, E-mail: degner@bah.com
Online Registration: http://iac.dtic.mil/surviacemail

3rd Association of Old Crows International Conference and Exhibit
May 20-24, 2000
Zurich, Switzerland
POC: Association of Old Crows (AOC) Conference Department
Com: (703) 549-1600 or (888) OLD-CROW, Fax-on-Demand: (800) 678-3324

11th Annual Integrated Air Defense Forum (IADS)
June 6-9, 2000
Nellis AFB, Nevada
POC: Thomas DeLuca
Com: (702) 652-2762, DSN: 682-2762, E-mail: thomas.deluca@bellis.af.mil

JUNE

Space & Air Survivability Workshop 2000
June 12-14, 2000
Colorado Springs, Colorado
POC: Shirley K. Good
Com: (303) 871-4049

JTCG/AS Model User Meeting (JMUM) (formerly D'DEAF_CRAB)
June 14-16, 2000
USAF Academy, Colorado Springs, Colorado
POC: SURVIAC, Mr. Paul Jeng
Com: (937) 431-2712, E-mail: surviacmodels@bah.com

Threats, Countermeasures, and Situational Awareness: Teaming for Survivability
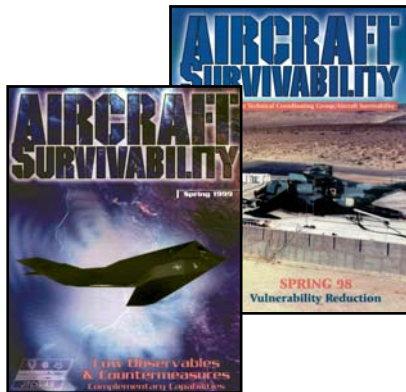**June 20-22, 2000**
Virginia Beach, Virginia
POC: Norm Papke
Com: (812) 854-3611, E-mail: papke_norman@crane.navy.mil

Check out our SURVIAC web site for updates on these and other events! http://iac.dtic.mil/surviac

Calendar of Events

SURVIAC

AFRL/VACS/SURVIAC, Bldg. 45
2130 Eighth Street, Ste. 1
Wright-Patterson AFB, OH 45433-7542